SYPHILIS (Including Congenital)

Disease Overview

Syphilis is a sexually-transmitted infection caused by the spirochete *Treponema pallidum*. If untreated, the infection progresses into a chronic infection: from primary, secondary, latent and tertiary stages or in congenital syphilis from early to late manifestations including syphilitic stillbirth.

Symptoms

Acquired syphilis can be divided into three stages: the primary stage is characterized by a painless chancre (ulcer) on the skin with a serous exudate that usually appears about three weeks after exposure. After four to six weeks the chancre involutes.

The secondary stage begins one to two months later and is characterized by a generalized secondary skin rash, mucocutaneous lesions, lymphadenopathy and is often accompanied by additional symptoms. Secondary manifestations resolve spontaneously within weeks to 12 months.

Although direct (often intimate) contact with lesions of primary and secondary syphilis poses the greatest risk of transmission, the lesions may not be readily apparent (e.g., painless lesions on the internal genital tract in females, intra-anal lesions, etc.). As such all patients with infectious syphilis should be considered potentially infectious regardless of the presence or absence of obvious lesions.

Untreated cases will go on to a latent stage that is variable and can last for weeks to years and is divided into early (<1 year) and late (>1 year) stages. Patients are seroreactive but demonstrate no clinical manifestations of the disease. Some latent cases will progress to the tertiary stage that includes cardiovascular syphilis and gumma formation.

Neurosyphilis is infection of the central nervous system with *Treponema pallidum* and can occur at any stage of infection.

Congenital syphilis is disease that occurs through vertical transmission of syphilis from mother to fetus during pregnancy or delivery. Intrauterine infections can result in stillbirth. Early manifestations of congenital syphilis (onset <2 years) may be asymptomatic or present as a generalized systemic disease (for example mucocutaneaous lesions, hepatosplenomegaly, neurosyphilis). Untreated infants, regardless of whether they have manifestations in early infancy, can also develop late manifestations (persistence >2 years) that involve the CNS, bones and joints, teeth, eyes and skin.

Mode of Transmission

The primary mode of transmission is by sexual contact, including vaginal, oral and anal sex. Kissing (oral-oral contact), sharing of needles and injection equipment, blood transfusion, accidental inoculation (e.g., needle stick injury) and solid organ transplantation have rarely been reported as routes of transmission. Transmission of syphilis from an infected mother to her infant can occur

before or at the time of birth. Mother to fetus is most probable during early stages of syphilis but can occur throughout the latent period. Infected infants may have moist mucocutaneous lesions that are more widespread than in adult syphilis and are a potential source of infection. Breastfeeding by mothers with primary or secondary lesions of syphilis carries a theoretical risk of transmission of syphilis to the baby.

Incubation Period

The incubation period for **primary syphilis** is usually 3 weeks following exposure (range 3 days to 90 days).

The incubation period for **secondary syphilis** is 2-12 weeks following development of primary lesions (chancre). (range 2 weeks to 6 months)

Period of Communicability

Primary, secondary and early latent stages are considered infectious.

A case is considered infectious until the end of the early latent period (approximately two years after infection).

Risk Factors

The following are risk factors for acquiring disease. A diagnosis of syphilis should be considered in anyone with signs or symptoms compatible with syphilis and also in the following individuals:

- Barrierless sexual activity involving contract with oral, genital or anal mucosa.
- Having experienced homelessness and/ or street involvement.
- Substance use, including chemsex.
- Having multiple sexual partners.
- Sexual contact with a known case of syphilis or other STBBI.
- HIV infection.
- Population groups and/ or communitities experiencing high prevalence of syphilis (and other STBBI)
- Those originating from or having sex with an individual from a country with a high prevalence of syphilis; it should be noted that screening for syphilis (using a non-treponemal test) is routinely performed in all immigration applicants to Canada who are older than 15 years.

Routine prenatal screening for syphilis and evaluation of newborn infants for congenital syphilis is recommended.

Surveillance Case Definition

Confirmed Case - Early Congenital Syphilis (within 2 years of birth):

Laboratory confirmation of infection in a live birth:

- identification of Treponema pallidum by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see Diagnosis and Laboratory Guidelines)

  or

- reactive serology (non-treponemal **and** treponemal) from venous blood (not cord blood) in an infant/child **with** clinical, laboratory or radiographic evidence of congenital syphilis*

  or

- infant's RPR titre at least fourfold higher than the mother/birthing parent's RPR titre in samples collected during the immediate postnatal period
  or

- persistent positive treponemal serology in a child older than 18 months of age

  and

- younger than two years of age at the time of meeting the criteria **and** no other suspected source of exposure

Confirmed case – Late congenital syphilis

Laboratory confirmation of infection:

- identification of Treponema pallidum by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see Diagnosis and Laboratory Guidelines)

  or

- reactive serology (non-treponemal **and/or** treponemal) in an individual **with** clinical, radiographic or other laboratory evidence of congenital syphilis*

  and

- two or more years of age at the time of meeting the criteria **and** no other suspected source of exposure

*** Evidence of congenital syphilis** includes any features suggestive of congenital syphilis on radiographs of long bones; reactive CSF VDRL; an elevated CSF cell count or protein (without other cause); anemia; skeletal abnormalities (e.g. osteochondritis, saber shins); hepatosplenomegaly; skin rash; condylomata lata; rhinitis (snuffles); pseudoparalysis; meningitis; ascites; interstitial keratitis; lymphadenopathy; dental abnormalities (e.g. Hutchinson's teeth, mulberry molars); sensory neural hearing loss; intrauterine growth restriction; prematurity; or any other abnormality not better explained by an alternative diagnosis

Probable case – Early congenital syphilis

Does not meet criteria for "Confirmed case – Early congenital syphilis"

and

- reactive serology (non-treponemal and/or treponemal) from venous blood (not umbilical cord blood) in an infant or in a child whose mother/birthing parent had untreated or inadequately treated** syphilis prior to delivery

and

- younger than two years of age at the time of meeting the criteria and no other suspected source of exposure

Confirmed case – Syphilitic stillbirth

A fetal death that occurs after 20 weeks gestation or in which the fetal weight is greater than 500 g with laboratory confirmation of infection [i.e. identification of Treponema pallidum by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see Diagnosis and Laboratory Guidelines)

Probable case – Syphilitic stillbirth

Does not meet criteria for "Confirmed case – Syphilitic stillbirth"

and

- a fetal death that occurs after 20 weeks gestation or in which the fetal weight is greater than 500 g where the mother/birthing parent had untreated or inadequately treated** syphilis prior to delivery

and

- no other cause of stillbirth established

**** Adequate treatment** is:

- treatment with penicillin therapy appropriate for the stage of syphilis infection that was completed at least 4 weeks before delivery; and
- sufficient reduction in maternal/birthing parent non-treponemal titers; and
- no evidence of reinfection.

A lack of verbal or written confirmation of treatment should be considered "inadequate treatment." Refer to current Canadian guidelines for additional information

Confirmed Case - Primary Syphilis

Laboratory confirmation of infection:

- identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing, or equivalent examination of material from a chancre or a regional lymph node

or

- presence of one or more typical lesions (chancres) and reactive treponemal serology, regardless of non-treponemal test reactivity, in individuals with no previous history of syphilis

or

- presence of one or more typical lesions (chancres) and a fourfold or greater increase in the titre over the last known non-treponemal test in individuals with a past history of syphilis treatment

Confirmed Case - Secondary Syphilis

Laboratory evidence of infection:

- identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing or equivalent examination of mucocutaneous lesions, condylomata lata and reactive serology (non-treponemal and treponemal)

or

- presence of typical signs or symptoms of secondary syphilis (e.g. mucocutaneous lesions, alopecia, loss of eyelashes and lateral third of eyebrows, iritis, generalized lymphadenopathy, fever, malaise or splenomegaly) AND either a reactive serology (non-treponemal and treponemal OR a fourfold or greater increase in titre over the previous known non-treponemal test

Confirmed Case - Early Latent Syphilis (< 1 year after infection)

Laboratory confirmation of infection:

- an asymptomatic patient with reactive serology (treponemal and/or nontreponemal) who, within the previous 12 months, had one of the following:
    - non-reactive serology
    - symptoms suggestive of primary or secondary syphilis
    - exposure to a sexual partner with primary, secondary or early latent syphilis

Confirmed Case - Late Latent Syphilis (> 1 year after infection or of unknown duration)

Laboratory confirmation of infection:

- an asymptomatic patient with persistently reactive treponemal serology (regardless of non-treponemal serology reactivity) who does not meet the criteria for early latent disease and who has not been previously treated for syphilis

Confirmed Case -Neurosyphilis infectious (< 1 year after infection)

Laboratory confirmation of infection:

- Fits the criteria in primary, secondary OR early latent syphilis above **AND** one of the following:
    - reactive CSF-VDRL in non-bloody cerebrospinal fluid (CSF)
    - clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes

Confirmed Case - Neurosyphilis non-infectious (> 1 year after infection) is laboratory confirmation of infection:

- reactive treponemal serology (regardless of non-treponemal serology reactivity) AND one of the following:
    - reactive CSF-VDRL in non-bloody CSF
    - clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes

Confirmed Case Tertiary Syphilis Other than Neurosyphilis

Laboratory confirmation of infection:

- reactive treponemal serology (regardless of non-treponemal test reactivity) together with characteristic late abnormalities of the cardiovascular system, bone, skin or other structures, in the absence of other known causes of these abnormalities (*T. pallidum* is rarely seen in these lesions although, when present, it is diagnostic)

  and

- no clinical or laboratory evidence of neurosyphilis

Diagnosis and Laboratory Guidelines

There are several test for diagnosis that can be performed on appropriate clinical specimens of syphilis including congenital syphilis. In addition to venous blood samples, appropriate clinical specimens for the diagnosis of syphilis include nasal secretions, skin lesions, fluid from blisters or exudative skin rashes, placenta, umbilical cord, or autopsy clinical material. Cord blood should not be used for infant testing.

Serological non-treponemal testing detects antibodies produced following tissue damage caused by *T. pallidum* and includes the rapid plasma reagin (RPR) test and. Treponemal testing detects the bacteria directly using immunologic methods (antibodies) and includes enzyme immunoassay (EIA). Screening for syphilis involves a non-treponemal test followed by a treponemal test

All New Brunswick regional laboratories perform serological screening testing for syphilis. Tests include a rapid plasma reagin (RPR) and enzyme immunoassay (EIA). Testing frequency differs from laboratory to laboratory depending on the number of requests.

Additional confirmatory testing mat be performed on all EIA tests. This is a second treponemal-specific test that include *T pallidium* particle agglutination (TP-PA), fluorescent treponemal antibody absorbed (FTA-ABS), and MHA-TP. The Georges-L. Dumont laboratory is the only regional laboratory to perform confirmatory testing in-house; other regional laboratories refer. Confirmatory testing is done by different laboratories, which all have their own turnaround time.

Contact your regional laboratory for more information on specimen collection and testing timelines.

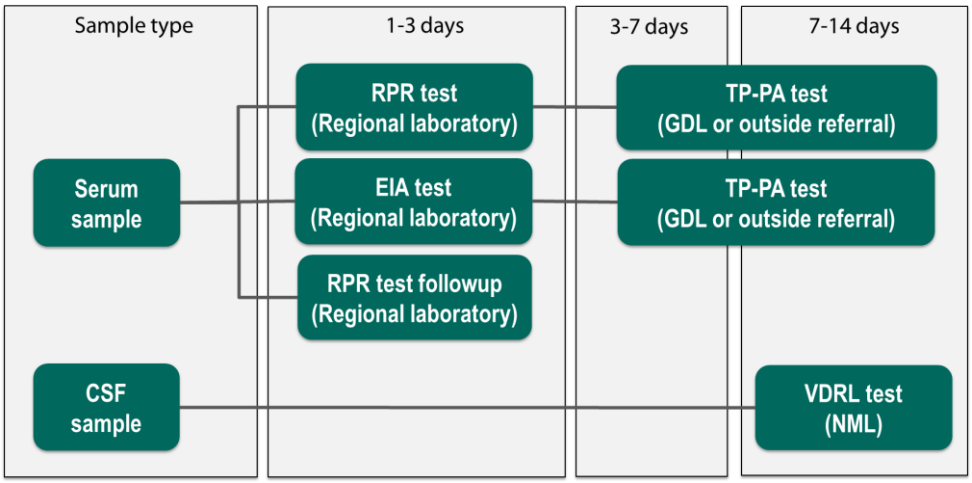
The venereal disease research laboratory (VDRL) at the National Microbiology Laboratory (NML) in Winnipeg currently does three tests: a non-treponemal test, fluorescent treponemal antibody absorption (FTA-ABS), and polymerase chain reaction (PCR) molecular detection test. In additional, all positive PCR test specimens are genotyped to detect azithromycin resistance.

The diagnosis of neurosyphilis must be done on cerebrospinal fluid (CSF) at NML.

For more information see Canadian Guidelines for Sexually Transmitted Infection.

Laboratory Testing

An overview of testing timelines for samples after the sample has been received by the laboratory. Turnaround times are averages and may change depending on the urgency of the situation.



Reporting

Per Policy 2.2 Disease and Event Notification to OCMOHE and Disease and Event Reporting section.

- Enhanced Surveillance. For all confirmed cases, an enhanced surveillance form should be completed and information sent to OCMOHE on a monthly basis (STBBI Database).
- Routine Surveillance (RDSS) for all confirmed cases. Probable case definitions are provided for surveillance purposes as reference.

Case and Contact Management

Case management, treatment, follow-up, exclusion/ social distancing according to the Introduction Sexually Transmitted and Blood Borne Infections document Syphilis (gnb.ca), and recommended per the Canadian Guidelines on Sexually Transmitted Infections - Canada.ca

Contact Management

Stage of Syphilis	Trace Back Period*
Primary Syphilis	3 Months
Secondary Syphilis	6 months
Early latent	1 year
Late (latent/tertiary)	Assess marital or other long-term partners and children as appropriate; the decision to test these contacts depends on estimated duration of infection in source case.
Congenital	Assess Mother and sexual partners
Stage undetermined	Assess/consult with a colleague experienced in syphilis management

* Trace-back period refers to the time period prior to symptom onset or date of specimen collection (if asymptomatic).

The length of time for the trace-back period should be extended:

1. to include additional time up to the date of treatment
2. if the index case states that there were no partners during the recommended trace back period, then the last partner should be notified
3. if all partners traced (according to recommended trace-back period) test negative, then the partner prior to the trace-back period should be notified.

Education

The case or relevant caregiver should be informed about:

- Potential for transmission to sexual partners
- The possibility of re-infection
- The importance of STBBI screening
- Vulnerability to STBBI
- Prevention of congenital syphilis for people of childbearing age
- Nature of the infection, length of the communicable period, and mode of transmission
- Safer Sex Practices

Investigation

Use Syphilis Investigation Form

Exclusion/ Social Distancing

Advise all people with potentially infection lesions such as chancres, condylomata lata and/ or rash of secondary syphilis to abstain from sexual contact until symptoms have resolved and for 7 days after treatment.

Treatment

Treatment should be offered as per the Canadian Guidelines on Sexually Transmitted Infections - Canada.ca

Immunization

Not applicable

Consideration of immunization for other STI's such as HPV, Hepatitis B, and Hepatitis A based on the New Brunswick Eligibility Criteria for Publicly Funded Vaccines/Biologics in NB

Outbreak Management

In consultation with the Regional Medical Officer of Health, activate the local outbreak plan when an outbreak is declared.